professional reader, require a little criticism for the benefit of the layman in these matters.

Dr. Hollander, like all enthusiasts, is inclined to lay the onus of failure of vision on those who do not agree with him. He disposes of his opponents on the ground that they do not follow out his system; but he must realise that some of the greatest intellects in science have been busy on these problems, and that they cannot all be wrong and only he be right. He must give a little credit to the labours of such men as Sir Frederick Mott, Sir Victor Horsley, and many others one might mention. Again, the difficulty the physicians of our mental hospitals have to face is not the fact that they are not allowed to fulfil their duty—they have every opportunity to do that in the very efficient and well-equipped modern mental hospital—but the attitude of the friends and relatives of the mental patient who, for sentimental reasons, oppose any effort to place the patient under proper care in the early stages of the disorder. As regards the question of treatment, of course everyone is entitled to whatever opinion he chooses, but it may be as well to point out that the consensus of modern opinion is that the day has not yet dawned when mental disorder can be treated by the surgeon. In a few cases of very definite brain injury an operation might be considered, but, even so, it is often found that the patient's last state is no better than the first.

Space does not permit of any detailed criticism of the remaining chapters of the book; it must suffice to say that the author passes on from criminology to thought reading and allied subjects, and ends upon a metaphysical note. The book is well written and well arranged; every credit must be given for the truly immense labour involved in its compilation; but it is to be feared that it is too much out of joint with the times to exercise much effect on the opinion of the day on these matters.

Mineralogy for Students.

(1) *Economic Mineralogy: A Practical Guide to the Study of Useful Minerals.* By T. Crook. Pp. xi+492. (London: Longmans, Green, and Co., 1921.) 25*s.* net.

(2) *Mineralogy: An Introduction to the Study of Minerals and Crystals.* By Prof. E. H. Kraus and Dr. W. F. Hunt. Pp. xiv+561. (New York and London: McGraw-Hill Book Co., Inc., 1920.) 27*s.*

EACH of these books is intended both as a text-book for students and as a work of reference for practical men.

(1) In Mr. Crook's case the reader has the advantage of his life-long employment on the economic investigation of minerals, while his experience as a lecturer enables him to appreciate the difficulties of the beginner. He carefully avoids unnecessary excursions into theoretical considerations, but his explanations, so far as they extend, are exceptionally clear and simple. He gives considerable attention to the optical examination of crystals, on account of its value in recognising minerals; and there is a helpful chapter on the use of the blowpipe and chemical methods generally. Another chapter is concerned with the physical analysis of crushed rocks and loose detrital sediments, a subject that the author has made peculiarly his own; and the short account of the geology of mineral deposits should be of use to the prospector.

The greater portion of the book is, however, devoted to a detailed description of the minerals of practical importance. The arrangement and treatment are frankly based on economic considerations, which should be a recommendation to all who are engaged in the commercial development of mineral resources. Moreover, Mr. Crook does not confine his attention to minerals in the strictly scientific meaning of the word, but includes all that is covered by the legal and technical definition of the term—everything which is mined for its economic value—so that coal, asphalt, and petroleum find their place in his survey. He also deals briefly with building materials and road metal. The volume concludes with some useful determinative tables, which are set out in such a manner that it is possible to glance rapidly through them in search of the information required. The text is illustrated by clear diagrams, and by excellent photographs of minerals taken by the author himself.

(2) Prof. Kraus and Dr. Hunt present us with a treatise of a somewhat more elaborate character, largely compiled from previous publications of one or both of the authors. Considerable attention is devoted to crystallography, and there are detailed tables for determining minerals. In the general description of the commoner minerals they are arranged according to the usual chemical classification, but there is a separate chapter on gem-stones, and another in which the minerals are classified according to the elements to which they owe their economic value. Monazite, however, appears in this section under cerium, which, although present in considerable amount, is of little commercial importance, instead of under thorium, for which it is almost exclusively worked. The use of tetra- (instead of tetarto-) in referring to a quarter-pyramid in the triclinic

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system should be corrected in another edition, as should also a few misprints (especially on p. 319). These are, however, matters of minor importance.

Taken as a whole, the book appears to be carefully and attractively written, and is illustrated by photographs of both minerals and crystal models, though it is doubtful whether the latter are really more effective than the line drawings that accompany them. There are also photographs of distinguished mineralogists, past and present, but a *caveat* must be entered to the claim that Werner was the first to place mineralogy on a scientific basis. The credit of the foundation of the science must be shared by some of his predecessors, such as Cronstedt, as well as by contemporaries like Kirwan.

JOHN W. EVANS.

Our Bookshelf.

Elements of the Mathematical Theory of Electricity and Magnetism. By Sir J. J. Thomson. Fifth edition. Pp. viii + 410. (Cambridge: At the University Press, 1921.) 30*s.* net.

EARLIER editions of this book were fully reviewed in NATURE, but the alterations and improvements in the present edition deserve special notice. One change—that in the treatment of hysteresis—makes the subject of energy dissipated in the magnetic field much clearer to the student. A piece of iron is put through a magnetic cycle and it is imagined as being displaced from one position in the field to another. The thing emphasised is the work done in effecting a displacement of a magnetic element in the field, which is $laI\delta H$, where H is the field intensity, I the intensity of magnetisation, and *la* the volume of the element. The former way of putting the matter puzzled the thoughtful student, while the thoughtless person accepted it without analysis of its meaning. It was said that "the diminution in the potential energy when the magnet moves into the stronger field is $Ial\delta H$." The change in potential energy was not this, but $la(I\delta H + H\delta I)$, and the thinker naturally wondered what had become of the term $laH\delta I$.

The most natural and convincing method of considering this matter is that due to the late Dr. John Hopkinson, and given when an attempt was made (not in this book) to demonstrate the hysteresis formula by juggling with the terms of the variation of a perfect differential. This method of Hopkinson's is to be found on p. 339. It considers the work thrown into the field from the battery when the magnetisation is changed by a magnetising current.

An interesting discussion of a gas the molecules of which are small magnets has also been added.

On the whole this edition of a sound and popular book is brought well up to date. All the alterations will be thoroughly appreciated by the student except that in the price, which has made a prodigious leap. It is a difficult time, as everyone knows, but many a student who would have willingly added this book to his own little stock of standard works will have to content himself with borrowing it.

A. GRAY.

Metabolism and Growth from Birth to Puberty. By F. G. Benedict and F. B. Talbot. (Publication No. 302.) Pp. vi + 213. (Washington: The Carnegie Institution of Washington, 1921.)

BENEDICT and Talbot's work on the "Metabolism and Growth from Birth to Puberty" of children of both sexes aged from one week up to fifteen years is a continuation of that on new-born infants published six years ago. The children were all physiologically normal, and some of the data are from the same children at different ages. Measurements of the weight, height, pulse-rate, and body-temperature are recorded, as well as the basal metabolism figures—*i.e.* the heat evolved in twenty-four hours in the subject at quiet repose and in the post-absorptive condition. These conditions were not easy to attain in the case of infants; there was not usually quiet repose unless some food was in the alimentary tract, but occasionally measurements were made as long as nine hours after a meal. The data are thus rather above the real basal figures than below. The basal metabolism is referred to age, weight, height, and body surface in a series of curves. The body surface was calculated by the Du Bois formula from actual measurements. Weight and height run parallel with age, and the basal metabolism increased from approximately 150 to 1100 Calories. In comparison with body surface the basal metabolism rose rapidly during the first year; after this age there was a continual decrease. There was no marked difference between the sexes, but after reaching the weight of 11 kilograms boys had a slightly higher metabolism than girls. All the data for basal metabolism are lower than those recorded by previous investigators. The publication is a valuable contribution to physiological literature.

Chemistry. By G. H. J. Adlam. ("Science for All" Series.) Pp. x + 238. (London: John Murray, 1921.) 3*s.* 6*d.* net.

THE book under notice is intended for a beginner who is "guided and inspired by a competent teacher." Many recent discoveries are included and the material is, on the whole, presented in an accurate and readable form. Several minor errors are, however, noticeable. Glaziers' "diamonds" are not "splinters" (p. 110); oxygen is not used in determining the flash-point of an oil (p. 119); the experiment described on p. 157 seems unlikely to succeed; the recovery of sulphur from alkali-waste is not without value (p. 170); and the carbon arc is not used in the fixation of nitrogen (p. 184). The atomic theory is explained only at the end of the book, although the method of counting the α-particles expelled from radium is referred to on p. 10.

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